



[4910-13-P]

DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

14 CFR Part 39

[Docket No. FAA-2015-3778; Directorate Identifier 2015-NE-27-AD]

RIN 2120-AA64

Airworthiness Directives; Rolls-Royce plc Turbopan Engines

AGENCY: Federal Aviation Administration (FAA), DOT.

ACTION: Notice of proposed rulemaking (NPRM).

SUMMARY: We propose to adopt a new airworthiness directive (AD) for all Rolls-Royce plc (RR) RB211-535E4-37, RB211-535E4-B-37, and RB211-535E4-C-37 turbopan engines. This proposed AD was prompted by a review of operational data that determined certain RR RB211-535E4-37 engines have been operated to a more severe flight profile than is consistent with the flight profile used to establish the cyclic life limits for the rotating parts. This proposed AD would require recalculating the cyclic life for certain engine life-limited rotating parts and removing those parts that have exceeded their cyclic life limit within specified compliance times. We are proposing this AD to prevent failure of life-limited rotating parts, which could result in uncontained parts release, damage to the engine, and damage to the airplane.

DATES: We must receive comments on this proposed AD by [INSERT DATE 30 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER].

ADDRESSES: You may send comments by any of the following methods:

- Federal eRulemaking Portal: Go to <http://www.regulations.gov>. Follow the instructions for submitting comments.
- Mail: Docket Management Facility, U.S. Department of Transportation, 1200 New Jersey Avenue SE., West Building Ground Floor, Room W12-140, Washington, DC 20590-0001.
- Hand Delivery: Deliver to Mail address above between 9 a.m. and 5 p.m., Monday through Friday, except Federal holidays.
- Fax: 202-493-2251.

For service information identified in this proposed AD, contact Rolls-Royce plc, Corporate Communications, P.O. Box 31, Derby, England, DE24 8BJ; phone: 011-44-1332-242424; fax: 011-44-1332-249936; email: http://www.rolls-royce.com/contact/civil_team.jsp; Internet: <https://customers.rolls-royce.com/public/rollsroycecare>. You may view this service information at the FAA, Engine & Propeller Directorate, 12 New England Executive Park, Burlington, MA. For information on the availability of this material at the FAA, call 781-238-7125.

Examining the AD Docket

You may examine the AD docket on the Internet at <http://www.regulations.gov> by searching for and locating Docket No. FAA-2015-3778; or in person at the Docket Operations office between 9 a.m. and 5 p.m., Monday through Friday, except Federal holidays. The AD docket contains this proposed AD, the mandatory continuing airworthiness information (MCAI), the regulatory evaluation, any comments received,

and other information. The address for the Docket Office (phone: 800-647-5527) is in the ADDRESSES section. Comments will be available in the AD docket shortly after receipt.

FOR FURTHER INFORMATION CONTACT: Robert Green, Aerospace Engineer, Engine Certification Office, FAA, Engine & Propeller Directorate, 12 New England Executive Park, Burlington, MA 01803; phone: 781-238-7754; fax: 781-238-7199; email: robert.green@faa.gov.

SUPPLEMENTARY INFORMATION:

Comments Invited

We invite you to send any written relevant data, views, or arguments about this proposed AD. Send your comments to an address listed under the ADDRESSES section. Include “Docket No. FAA-2015-3778; Directorate Identifier 2015-NE-27-AD” at the beginning of your comments. We specifically invite comments on the overall regulatory, economic, environmental, and energy aspects of this proposed AD. We will consider all comments received by the closing date and may amend this proposed AD based on those comments.

We will post all comments we receive, without change, to <http://www.regulations.gov>, including any personal information you provide. We will also post a report summarizing each substantive verbal contact with FAA personnel concerning this proposed AD.

Discussion

The European Aviation Safety Agency (EASA), which is the Technical Agent for the Member States of the European Community, has issued EASA AD 2015-0148, dated

July 23, 2015 (corrected July 24, 2015), referred to hereinafter as “the MCAI”, to correct an unsafe condition for the specified products. The MCAI states:

A review of operational flight data has revealed that some RB211-535 engines may have been operated beyond the flight profile (FP) assumed by the operator when establishing the operational limits (life limits) within which the corresponding critical parts are allowed to remain installed.

This condition, if not corrected, may lead to critical part failure, possibly resulting in release of high energy debris, damage to the aeroplane and/or injury to the occupants.

To preclude failure of an engine life-limited part, the MCAI specifies, and this proposed AD would require, recalculating the cyclic life for certain parts, and removing from service those parts that have exceeded their cyclic life limit within specified compliance times. This proposed AD would establish a new default Flight Profile G for RB211-535E4-37 engine life-limited parts. If, however, operators meet the requirements of Appendix 6 of RR Alert Non-Modification Service Bulletin (NMSB) No. RB.211-72-AH972, Revision 3, dated August 28, 2015, they may operate to Flight Profile A or B. You may obtain further information by examining the MCAI in the AD docket on the Internet at <http://www.regulations.gov> by searching for and locating Docket No. FAA-2015-3778.

Related Service Information under 1 CFR Part 51

RR has issued Alert NMSB No. RB.211-72-AH972, Revision 3, dated August 28, 2015. The NMSB describes a new flight profile, the consumed cyclic life corrections for prior operation of affected parts, and the removal from service recommendations for parts that have exceeded their cyclic life limit. This service information is reasonably available

because the interested parties have access to it through their normal course of business or by the means identified in the ADDRESSES section of this NPRM.

FAA’s Determination and Requirements of This Proposed AD

This product has been approved by the aviation authority of the United Kingdom and is approved for operation in the United States. Pursuant to our bilateral agreement with the European Community, EASA has notified us of the unsafe condition described in the MCAI and service information referenced above. We are proposing this AD because we evaluated all information provided by EASA and determined the unsafe condition exists and is likely to exist or develop on other products of the same type design. This proposed AD would require recalculation of the remaining cyclic life for the affected engine life-limited parts and removal from service of parts that exceed their cyclic life limit.

Costs of Compliance

We estimate that this proposed AD affects 107 engines installed on airplanes of U.S. registry. Pro-rated cost of the lost cyclic life as a result of the corrections would be about \$25,417,324. We estimate it will take 1 hour to recalculate the consumed cyclic life and revise the engine records. The average labor rate is \$85 per hour. Based on these figures, we estimate the cost of this proposed AD on U.S. operators to be \$25,426,419.

Authority for This Rulemaking

Title 49 of the United States Code specifies the FAA’s authority to issue rules on aviation safety. Subtitle I, section 106, describes the authority of the FAA Administrator. “Subtitle VII: Aviation Programs,” describes in more detail the scope of the Agency’s authority.

We are issuing this rulemaking under the authority described in “Subtitle VII, Part A, Subpart III, Section 44701: General requirements.” Under that section, Congress charges the FAA with promoting safe flight of civil aircraft in air commerce by prescribing regulations for practices, methods, and procedures the Administrator finds necessary for safety in air commerce. This regulation is within the scope of that authority because it addresses an unsafe condition that is likely to exist or develop on products identified in this rulemaking action.

Regulatory Findings

We determined that this proposed AD would not have federalism implications under Executive Order 13132. This proposed AD would not have a substantial direct effect on the States, on the relationship between the national Government and the States, or on the distribution of power and responsibilities among the various levels of government.

For the reasons discussed above, I certify this proposed regulation:

- (1) Is not a “significant regulatory action” under Executive Order 12866,
- (2) Is not a “significant rule” under the DOT Regulatory Policies and Procedures (44 FR 11034, February 26, 1979),
- (3) Will not affect intrastate aviation in Alaska to the extent that it justifies making a regulatory distinction, and
- (4) Will not have a significant economic impact, positive or negative, on a substantial number of small entities under the criteria of the Regulatory Flexibility Act.

List of Subjects in 14 CFR Part 39

Air transportation, Aircraft, Aviation safety, Incorporation by reference, Safety.

The Proposed Amendment

Accordingly, under the authority delegated to me by the Administrator, the FAA proposes to amend 14 CFR part 39 as follows:

PART 39 - AIRWORTHINESS DIRECTIVES

1. The authority citation for part 39 continues to read as follows:

Authority: 49 U.S.C. 106(g), 40113, 44701.

§ 39.13 [Amended]

2. The FAA amends § 39.13 by adding the following new airworthiness directive (AD):

Rolls-Royce plc: Docket No. FAA-2015-3778; Directorate Identifier 2015-NE-27-AD.

(a) Comments Due Date

We must receive comments by [INSERT DATE 30 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER].

(b) Affected ADs

None.

(c) Applicability

This AD applies to all Rolls-Royce plc (RR) RB211-535E4-37, RB211-535E4-B-37, and RB211-535E4-C-37 turbofan engines.

(d) Reason

This AD was prompted by a review of operational data that determined that certain RR RB211-535E4-37 engines have been operated to a more severe flight profile than is consistent with the flight profile used to establish the cyclic life limits for the rotating parts. We are issuing this AD to prevent failure of life-limited rotating parts,

which could result in uncontained parts release, damage to the engine, and damage to the airplane.

(e) Actions and Compliance

Comply with this AD within the compliance times specified, unless already done.

Within 21 days after the effective date of this AD:

(1) For RR RB211-535E4-37 engines, establish a new flight profile, Flight Profile G, as the new default profile for flight operations and new part lives for life-limited parts.

(i) Use Appendix 6 of RR Alert Non-Modification Service Bulletin (NMSB) No. RB.211-72-AH972, Revision 3, dated August 28, 2015, to define Flight Profile G.

(ii) Use the definition of Flight Profile G in Appendix 6 and the maximum approved cyclic lives in Appendix 2 of RR Alert NMSB No. RB.211-72-AH972, Revision 3, dated August 28, 2015, to identify the new lives for life-limited parts.

(iii) If operators meet the requirements of Appendix 6 of RR Alert NMSB No. RB.211-72-AH972, Revision 3, dated August 28, 2015, they may operate to Flight Profile A or B.

(2) For all RB211-535E4-37, RB211-535E4-B-37, and RB211-535E4-C-37 engines, determine if any part identified by part number and serial number in Appendix 4 of RR Alert NMSB No. RB.211-72-AH972, Revision 3, dated August 28, 2015, is installed on the engine.

(i) Do not return to service any engine with a part identified in paragraph (e)(2) of this AD after the part reaches the “Compliance Time” date or cycles, whichever occurs first, as specified in Appendix 4 of RR Alert NMSB No. RB.211-72-AH972, Revision 3, dated August 28, 2015.

(ii) For each part identified in paragraph (e)(2) of this AD without a “Compliance Time” that has a lifing correction identified, apply the lifing correction for each part using the “Additional Life Consumed Flight Cycles” specified in Appendix 4 of RR Alert NMSB No. RB.211-72-AH972, Revision 3, dated August 28, 2015.

(3) For RB211-535E4-37 engines operated to Flight Profile G with parts listed in Appendix 4 of RR Alert NMSB No. RB.211-72-AH972, Revision 3, dated August 28, 2015, do the following:

(i) Re-calculate the consumed cyclic life of the low-pressure (LP) compressor shaft, LP turbine shaft, LP turbine disk Stage 2, intermediate-pressure compressor rotor shaft Stage 1 to 6, high-pressure (HP) compressor rotor disk Stage 1 and 2, HP compressor rear rotor shaft assembly, and HP turbine disk as follows.

(ii) Determine the Flight Profile G cycles in service (CIS). Count all CIS accumulated since April 1, 2015, inclusive.

(iii) Use the Flight Profile G cycles in service from paragraph (e)(3)(ii) of this AD, the maximum approved lives in Appendix 2 of RR Alert NMSB No. RB.211-72-AH972, Revision 3, dated August 28, 2015, and Figure 1 to paragraph (e) of this AD to calculate the new consumed cyclic lives.

**Figure 1 to Paragraph (e), Calculations to Move Group ‘A’ and Group ‘B’
Parts Between Engine Marks and/or Flight Profiles**

- Step (a) Calculate the fraction of the components life used (FLU) in each of the original Engine Marks (EM) or flight profiles (FP)
- $$FLU1 = \frac{\text{Cycles in 1st EM or FP}}{\text{1st EM or FP Declared Life}}$$
- $$FLU2 = \frac{\text{Cycles in 2nd EM or FP}}{\text{2nd EM or FP Declared Life}}$$
- $$FLUn = \frac{\text{Cycles in nth EM or FP}}{\text{nth EM or FP Declared Life}}$$
- Continue until the FLU has been calculated for all Engine Marks and flight profiles in which the component has been operated
- Step (b) Calculate the total fraction of life used (TFLU)
- $$TFLU = FLU1 + FLU2 + + FLUn$$
- Step (c) Calculate equivalent cycles since new (CSN) for the component in the new Engine Mark or flight profile
- $$\text{Equivalent CSN} = TFLU \times \text{Declared Life in the new Engine Mark or flight profile}$$
- Step (d) If required, calculate the cycles remaining to the Declared Life in the new Engine Mark or flight profile
- $$\text{Cycles remaining} = \text{Declared Life in the new Engine Mark or flight profile} - \text{Equivalent CSN}$$

(f) Alternative Methods of Compliance (AMOCs)

The Manager, Engine Certification Office, FAA, may approve AMOCs for this AD. Use the procedures found in 14 CFR 39.19 to make your request. You may email your request to: ANE-AD-AMOC@faa.gov.

(g) Related Information

(1) For more information about this AD, contact Robert Green, Aerospace Engineer, Engine Certification Office, FAA, Engine & Propeller Directorate, 12 New England Executive Park, Burlington, MA 01803; phone: 781-238-7754; fax: 781-238-7199; email: robert.green@faa.gov.

(2) Refer to MCAI European Aviation Safety Agency AD 2015-0148, dated July 23, 2015 (Corrected July 24, 2015), for more information. You may examine the MCAI

in the AD docket on the Internet at <http://www.regulations.gov> by searching for and locating it in Docket No. FAA-2015-3778.

(3) RR Alert NMSB No. RB.211-72-AH972, Revision 3, dated August 28, 2015, and Task 05-00-01-800-000, “Recording and Control of the Lives of Parts”, dated July 1, 2015, of the RR RB211-535E4 Time Limits Manual (TLM), publication reference T-211(535)-6RR, Revision 49, dated July 1, 2015, can be obtained from RR using the contact information in paragraph (g)(4) of this proposed AD.

(4) For service information identified in this proposed AD, contact Rolls-Royce plc, Corporate Communications, P.O. Box 31, Derby, England, DE24 8BJ; phone: 011-44-1332-242424; fax: 011-44-1332-249936; email: http://www.rolls-royce.com/contact/civil_team.jsp; Internet: <https://customers.rolls-royce.com/public/rollsroycecare>.

(5) You may view this service information at the FAA, Engine & Propeller Directorate, 12 New England Executive Park, Burlington, MA. For information on the availability of this material at the FAA, call 781-238-7125.

Issued in Burlington, Massachusetts, on October 28, 2015.

Colleen M. D’Alessandro,
Directorate Manager, Engine & Propeller Directorate,
Aircraft Certification Service.
[FR Doc. 2015-28080 Filed: 11/3/2015 8:45 am; Publication Date: 11/4/2015]